Math 10860, Honors Calculus 2

Quiz 8

Thursday April 2

1. Taylor's theorem with Lagrange remainder term says that given a function f, a real a, a natural number n, and a real x, if certain hypotheses are satisfied then

$$f(x) = f(a)+f'(a)(x-a)+\frac{f''(a)}{2}(x-a)^2+\cdots+\frac{f^{(n)}(a)}{2}(x-a)^n+R_{n,a,f}(x),$$

with $R(n, a, f)(x)$ taking a certain form. State the necessary hypotheses, and the exact form that $R(n, a, f)(x)$ takes.

2. Show that $x + x^2/2$ agrees to order 2 with $\log(x^2 + x + 1)$ at 0.

3. What is the highest order to which $x^7 + x^6$ and $x^7 - x^5$ agree at 0?